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# THE SENSES, THE BRAIN, AND THE MIND;

THEIR CONNECTIONS AND RELATIONS.

A L E C T U R E

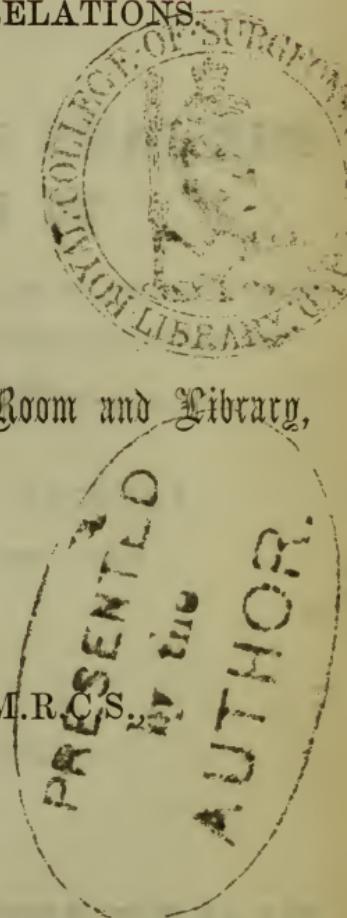
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BY

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MEDICAL OFFICER OF HEALTH.



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FIG. 1.

FIG. 3

FIG. 2

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# LECTURE

ON

## THE SENSES, THE BRAIN, AND THE MIND.

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THE subject to which I purpose calling your attention this evening, is of the greatest importance to human welfare. If there be any one remedy for the numerous evils of human life, that remedy must be a knowledge of the mind, and cultivation of its thinking powers. If there be a cure for the Anti-Christian results of enormous wealth and debasing poverty, for the conventionalisms, the insincerity, the indifference to substantial truths, and to the fundamental principles of morality and religion, which too glaringly characterize the age in which we live, it can only be by acquiring a knowledge of those intuitive laws of action, conduct, and thought, to be deduced from examining that greatest of God's work—the mind of man. I have no hesitation in asserting my belief that a consistent, persevering inquiry into the actuating principles, faculties, sentiments, desires, and emotions of the mind, is the only true mode of obtaining an insight into the right method of governing mankind; that all human training, whether of children or adults, ought to be derived from the laws of mind; those laws upon which depend the religious and moral feelings, the powers of knowing, of reasoning, of judging; principles of action without which there can be no sound health of mind or body, no true happiness either in the individual or that congregation of individuals which constitutes society or the State. If we would arrive at the real means of governing mankind, we must discover that which we have to govern, and which lies hidden in the recesses of human thought, feeling and will. Unless we know the character of that for which we legislate, how can we legislate truly. Now, it is human impulse, human feeling, human thought, and human will, to which all law should be directed, and therefore is it the duty of all to study the nature of that which they must have to direct and to govern either in themselves or their children, or their dependants. The only key to wise government must be a knowledge of mind in all its relations, in the individual, the family and the State.

*To know ourselves* is the highest of knowledge, and there is none which brings with it so much satisfaction, or which has so large a tendency to explain and reconcile the apparent inconsistencies of human nature. Nothing can tend so much to human happiness as the science which teaches the development of those glorious faculties of thought, of language, and of reason, which, when duly cultivated, are all sufficient for our welfare.

I shall begin my lecture by a short description of the Brain and Nerves. With the aid of a few diagrams I think you will comprehend enough to make what I have to say intelligible. We can only hope, in a single lecture, to impart a few suggestions on such a subject, sufficient perhaps to induce some minds to investigate farther for themselves.

The brain is the most important part of the nervous system, properly speaking it is an addition to the nervous system, only appertaining to the highest classes of animals. The lowest classes of animals have a nervous system with nervous centres, but these centres are not analogous to the human brain. The nerves, as you see in this diagram of an insect (fig. 1), branch from centres corresponding with each division of the body ; these centres we call ganglions, where we believe that power to be generated which is carried by the nerves to impart motion to the limbs, and sensation to the senses. These ganglia, as animals advance in power, become congregated about the head, as you see in this diagram of a fish (fig. 2), and beyond these sensory ganglia the brain proper is developed. There is no true brain in any creature below the fish, and in them it is very small (*d*, fig. 2.) Even in birds the contents of the skull consist almost entirely of ganglia or nervous centres of motion and sensation. In quadrupeds the brain gets larger and larger, as intelligence increases. But even in man the whole of the skull is not filled by the brain proper, but partly by what are the ganglia of sensation and motion, as you see in this diagram, where all above (*b*, fig. 3), is brain subservient to intellect, while all below including the continuation through the spine, is analogous to the ganglia of motion and sensation in the lower animals\*.

\* From that part of the nervous system which has been called the spinal marrow, or spinal cord, extending from the brain proper down the spine, we see nerves given off on each side : some bringing to the nervous centres all sensations of heat, cold, pain, &c., experienced in any part of the body ; others carrying from the centre to the limbs and body that power which enables our muscular system to act and perform the various motions so essential to our welfare. Common sensation and muscular motion then are the important offices

From the ganglia about the upper part of the spinal marrow at its junction with the little brain (*b*, fig. 3), and the great brain (*a*, fig. 3), a large number of nerves arise, most of them being the nerves of the special senses, the eye, the ear, &c., bringing into the brain the peculiar sensations for which they are the enunciators, between the eyes, the ears, the nose, the tongue, the fingers, &c. About this part of the brain is the seat of special sensation, where the knowledge acquired by each of our external senses is brought and distributed to those parts of the brain adapted and destined for the conversion of sensations into perceptions or cognitions of the light, colour, proportion, solidity, weight, number, and other attributes of the things and the phenomena of the outer world. Here enter sensations from without, which, meeting within the brain various affinities and intuitions, each adapted to its own special sense, the two factors of knowledge, the one from without—sensation, and the one from within—perception, combine to give us cognitions or knowledge.

In the obtaining knowledge from without, in the perceiving and registering it within, the gray matter of the brain is supposed to play an important part. We find within the eye-ball that the expansion of the optic nerve, the retina,

of that part of the nervous system which extends from the head downwards through the spine. It is, like the brain proper, composed of two different substances, gray matter and white matter. At the upper part of the spinal cord, where it joins the brain, we find a number of enlargements called ganglia, which also consist of gray and white matter. Here the spinal cord joins the little brain or cerebellum (fig 3—*b*), which also consists of the two substances, gray and white; and here also the spinal cord joins the cerebral hemispheres, the whole outer surface of which consists of the gray matter, and nearly the whole interior of the true brain consists of the white matter. The gray matter is thought to originate power, and the white matter to be like the wires of the Electric Telegraph—the conductor of power.

In the frontispiece are represented, Fig. 1, the nervous system of an insect. Fig. 2, the sensory ganglia and brain of a fish. Fig. 3, the brain, spinal cord, and nervous system of man. The true brain of the fish is very small, being the two corresponding lobes marked *d*, the others are ganglia, subservient to sensation and motion. There are analogous ganglia in the human brain, which are all below the true brain or cerebral hemispheres, marked *a*. Special sensation, that is seeing, hearing, feeling, tasting, and smelling; common sensation, pain, heat, and cold, &c.; and muscular motion, are all provided for by the nervous centres at the top of the spinal cord, and the cord itself. The nerves emanating from the spinal cord receive sensations from, and carry motive power to, all parts of the body. The nerves emanating from the ganglia about the point where the spinal cord joins the brain proper, are destined for special sensation, and here will be the point where sensations are received; the sensorium, where the information collected by the organs of sense is registered and converted into perceptions, or carried further into the brain itself, there to become food for our intellectual powers as perceptions, cognitions, and ideas.

consists entirely of the gray matter in all respects similar to that which is expanded over the whole surface of the brain. The retina receives the sensations of light, colour, form, &c., and transmits them by the optic nerve to a part of the brain where the gray matter again appears; and as the gray matter in the eye-ball is concerned in forming the sensation of light, so the gray matter at the other end of the optic nerve in the brain is probably concerned in changing the sensation into the perception of light, &c. We know the important office of that small piece of gray matter forming the inner coat of the eye-ball, how it takes cognizance of colour, form, distance, and the numerous offices connected with the organ of sight. Now, the expansion of the retina does not exceed three square inches in extension, and is very thin, while the gray matter on the surface of the brain is many times thicker, and spread out would cover 670 square inches, or 10 feet by  $5\frac{1}{2}$ . Seeing the all-important duties performed by the comparatively small pieces of gray matter which are subservient to the sensations of light and sound in the interior of the eye and the ear, we may imagine the multitudinous duties which must be performed by the outer surface of the brain in the generation of that force which is in all probability concerned in converting the information collected by our external senses into the innumerable perceptions and cognitions upon which our mind thinks, reasons, and draws conclusions.

If the gray or vesicular matter of the brain and ganglia be the seat or source of power, what can be the office of the enormous quantity of this matter which forms the outer coating of the cerebral hemispheres? The gray matter of the spinal cord, of the ganglia of special sensation, and of the cerebellum gives the powers of seeing, hearing, feeling, smelling, tasting in all their relations, and supplies muscular power to all parts of the body. The innumerable nerves of motion and common sensation distributed every where, are dependant on it for their influence in all the intricacies of sensation and motion. Now, the proportion of the gray matter in all the nervous centres below the true brain cannot exceed the proportion of one part to a hundred in the cerebral hemispheres. We may make it a problem for the rule of three: If the one portion of gray matter in the spinal cord, the sensory ganglia, the cerebellum, and we might add, in the ganglia of the sympathetic nerve, can effect all the phenomena of special sensation, muscular motion, com-

mon sensation, digestion, respiration, and all the secretions of the body, what will the hundred parts of similar gray matter in the cerebral hemispheres effect? The answer will be, that this enormous reservoir of power must be influential in the development of the intellectual and moral faculties. It is here in all probability that the instinctive or intuitive principles are located: those intuitions from which originate our desires, our affections, sympathies, and social sensibilities, our moral sense, and our religious aspirations, our powers of comparing all the relations of phenomena, their causes and effects, our intuitive capabilities of contemplating time and space, infinity and eternity,—in a word, all that aids us in the development of the inductions, conclusions and judgments of our intellectual faculties, and their expression in signs and language.

When we reflect on the multiplicity of the phenomena, the relations and the laws of the various sciences which it is in the power of the human mind to acquire: when we reflect on the numerous problems of philosophy which extend as our knowledge extends: when we reflect on all the capabilities of imagination, ideality and poetry, we may conceive business enough for all the gray matter of the cerebral hemispheres, in supplying the necessary power to collect and classify all the facts and phenomena of the outward world which excite into action the latent yet transcendent faculties of human intelligence.

The position of an animal in the scale of being, is directly dependant on the degree of development of its nervous system. Whatever the grade of intelligence may be, it is correspondent to the expansion of the nervous system, which increases in development through all classes of animals from its very rudimentary form in the lowest creatures, to a gradually higher degree in fishes, reptiles, birds, and mammalia: reaching its climax in the most intelligent of terrestrial beings—man. The nervous system in its full development, consists of nerves, spinal cord, and brain; these exhibit two kinds of structure, one white and fibrous, and the other gray and vesicular,—the latter is found in various parts of the brain, spinal cord, and ganglia: the former serves to connect these masses with one another, and furnish means of communication from point to point. The ganglia or nervous centres receive impressions from without, and originate motion and thought by an impulse from within. Impressions of external circumstances are registered in the brain, exciting its latent power, whereby the intellectual processes are induced or stimulated into action.

If you tie or cut a nerve, it no longer transmits the usual influences ; you paralyze motion, and intercept sensation. Sensation being produced by the agency of the outward senses, and motion by the agency of the instincts or intuitions from within.

There can be no doubt that the cerebral hemispheres of the brain constitute the instrument through which the mind exerts its influence on the body. Any injury of sufficient severity inflicted upon them, is at once accompanied by loss of intellectual power ; any malformation or lesion by disease, is attended by a deterioration of one or more of our internal sensibilities : any unusual development with correspondingly increased intellectual powers, not only as regards animals of different tribes, but of different men compared with each other. The general impression is founded on fact, that the men who have distinguished themselves for mental attainments or intellectual power, have been also distinguished for the unusual development of their cerebral hemispheres. There is, however, one fact which appears to modify our conclusions as to absolute size of brain, and that is symmetry of the two sides. I think, you will never see a well-modelled head, even of small size, without remarkable observing, knowing, and thinking powers. On the other hand, you will never see a very unsymmetrical, or deformed, or very small head, without inferiority of intellectual power, eccentricity, idiocy, or insanity. Such heads exhibit disproportion of the two halves of the brain, and such disproportion appears to give rise to a want of harmony in the various sensibilities and intellectual faculties. Very symmetrical, globular heads, although small, have been accompanied with highly developed intellectual and moral powers.

To what extent the material structure of the nerves and brain are connected with the mind, is one of the most interesting and important of problems. To solve it entirely in the present state of our knowledge, is impossible ; but we know enough of nerve influence, and we know enough of the workings of the mind within, to make an attempt in this direction ; and I think the inquiry in itself will not only tend to elevate our thoughts beyond the present transitory stage of our existence, but also enable us to carry out with more satisfaction the purposes and objects of our daily life. Milton says—

“ In the soul  
Are many lesser faculties, which serve  
Reason as chief.”

The faculties of the mind are indeed numerous, including those of our external and internal senses, very numerous. The external senses of sight, hearing, &c., must be included among the faculties of the understanding, because by their teaching, the intuitive principles of the mind are excited into action: they are our first instructors. The sensations transmitted by the nerves of the senses to the brain, are the beginnings of knowledge, and the beginnings of mental action. We must consider the brain and the nerves as one organ; at the outward extremity of the nerves of sight and of hearing are portions of structure entirely analogous to that gray matter we have seen to constitute the outer surface of the convolutions of the brain, while the nerves themselves are analogous to the white matter which constitutes the central portions of the brain. The gray matter of the retina receives the impressions brought to it by the telescopic powers of the organism of the eye; these impressions the optic nerve transmits to the sensory ganglia at the base of the brain, where gray matter again appears, through the influence of which perception is aroused, and the understanding made acquainted with the facts brought to it from the outer world. What takes place within the brain to convert sensations into perceptions and ideas, we do not know. We are lost in admiration at the marvellous power with which we have been gifted to perceive and comprehend the innumerable teachings of the eye; the lovely form, order, and proportion of the objects it gazes on, the variety of their colour, their various distances, the light and shade so necessary to their just conception, the grouping of trees, the hill and the dale, the land and the water, all the glorious features of an extensive prospect on which the sense of beauty in our mind dwells with exquisite delight. Although now capable of ranging over an extensive landscape, and contemplating its various beauties as one whole, there was a time when this would have been impossible; the nerves of the eye required much tuition before they could accomplish the task of arranging the variety of objects of an extensive natural prospect into the unity of a picture. The form, size, proportion, colour, and other qualities of a single object, are among the first lessons transmitted by the nerves of the senses to the brain, and through the brain to the mind. Watch an infant when you give it a toy or other substance, how indistinctly it handles it at first, but at length turns it in all directions, twisting its little fingers around and about it in every possible

way, looking at it at the same moment in all its aspects, while the nerves of sensation are busy carrying inwards information of colour, size, weight, &c., and thus we begin to learn the nature of the objects of the outer world.

But mere sensations could never give us knowledge, unless we had internal faculties endowed with instinctive or intuitive powers to appreciate and comprehend the nature of the phenomena of the outside world. We must have within our brain power to analyze colours, and to class them in a certain order. The optic nerve does not appreciate the differences of colour ; this is done by an internal sense. The eye observes the various colours, and the optic nerve carries the sensations of these various colours to the brain ; here the sensations must be met by powers to class them in a certain order, and to give to each colour its specific name. These powers of classification and of language must be founded on pre-established laws, for all men of all countries, with here and there an exception, agree in regard to the various colours and their relations. Every one knows by instinct or intuition the scale of colours, that is to say, we all have an internal apperceptive faculty, which at once perceives the difference between red and green, blue and yellow. Here the faculty of language is called upon to find names for the cognitions thus obtained, and which names we soon learn to apply to each distinct colour in the dialect of the country of our birth. There is nothing accidental in the perception and appreciation of colours, it is not mere experience, but the result of a pre-established harmony between the mental power of conception and the nature of external objects. Whether these objects be colours, or forms, or substances, we have within us faculties specially adapted by primary laws of mind to see all their relations, and to arrange or classify them accordingly. It has been justly observed, that the structure of the eye proves the prior existence of the science of optics.

We infer the pre-existence of the laws by which light and colour are regulated ; because an external organ has been given us to feel the sensations of light and colour, and to transmit them internally to another organ which has the power of knowing at once what light and colour indicate, and to arrange them so that they become to us knowledge. Then steps in the wondrous faculty of language, by which we name all objects, and are enabled to store them in our memory by specific words, and to communicate all the internal feelings and ideas so established, to other creatures having minds

like our own. What grand and glorious privileges are here developed ! not only are we gifted with intelligent powers to know the universe, but all human beings have the same powers to sympathize with each other, and hold together the most intimate intercourse. The daily and hourly employment of these powers make them so common, that we rarely stop to regard their worth ; but when we lose any of these senses we become aware of their inestimable value.

*" That which we have we prize not to the worth,  
Whiles we enjoy it, but being lack'd and lost,  
Why then we rack the value : then we find  
The virtue, that possession would not show us,  
Whiles it was ours."*

Let us pursue the optic nerve into the brain, and endeavour to see how far physiology will aid us in our investigations into the nature of mind. Perception, language, and reason are three powers by which we arrive at truth. By perception, we learn the objects and phenomena of the universe, material bodies and their qualities or attributes are taken cognizance of by our external senses, carried inwards to the brain, where they are met by various internal powers or senses, and the combined effect produces results which are named perceptions ; these are again moulded by another internal power, the understanding. The innate instinct of language is then called into requisition to name the objects and qualities presented to the mind through the nerves, the ganglia, and the brain. Here an entirely new process commences, nerve power ceases, mere sensation comes to an end, and the spiritual part of our nature is put into action. The names of objects, attributes, and phenomena, are registered in the memory by language, and established within us as ideas, the proper food of our intellectual faculties, now called upon to reflect on the signs and significations of language, which is ever accumulating, first by sensations and perceptions, and then still more by the inferences and deductions of the mind itself through the laws with which it has been endowed by an all-seeing and all-powerful Intelligence, who has fashioned our faculties to the beautiful earth he has given us for a habitation. As are the laws of the universe, so are the laws of the mind ; God willed that man should make himself acquainted with the manifold objects to be met with in his explorations of the earthly globe destined for his habitation, and He endowed him with a mind capable of comprehending the nature of its various structures, and of reducing them all to classification and to science.

If we analyze mind into its elements, we find desires, affections, emotions, among the primary influences which arouse our latent understanding, our reflecting powers, and our reason. These internal sensibilities are native to the mind itself, they are born within us, are first principles altogether independant of any material external causes. Feeling is the term which has been generally applied to the phenomena of the internal senses and sensibilities; sensation to those of the outward senses; but from both result experience, and experience is the spur which stimulates to action our consciousness, our understanding, and our pure reason.

The term sensation is usually applied to the results of the action of external objects and phenomena on our organs of special sense, the eye, the ear, the nose, the tongue, and the skin. Each of the senses has a special object, and its operations are confined to that one object—the ear, its organic structure and its nerves, perform for us all the offices connected with sound, and nothing more; its nerve is limited to this one object, and is not employed to connect the parts with the brain for the common objects of feeling and muscular motion, for these purposes there are distinct nerves. The term feeling ought to be restricted to the action of those general nerves of sensation which tell us of heat, cold, and pain, in distinction with the special sensation of touch; but unfortunately the imperfection of language obliges us often to use the same terms for distinct ideas. I have shown you that the nerves of common feeling and the nerves of muscularity are connected with distinct portions of the spinal cord. So each nerve of special sensation is connected with this same part of the nervous system, or with distinct ganglia attached to it, and not directly with the brain proper. There would appear to be a sensorium for the reception of all sensation, forming an intermediate stage, which breaks the information carried inwards before it is transmitted to the cognitive powers of the mind.

The nerves of feeling and motion, from and to all parts of the body, are connected with the spinal cord: the nerves of special sensation, seeing, hearing, &c., are connected with the upper part of the spinal cord, and the ganglia at the base of the brain; so that all these important functions are provided for below the brain proper, that is below the point marked *b* on the wood-cut. Fig. 1 represents the nervous system of the insect, lobster, &c., where there is no brain at all, so that in these tribes of creatures all sensation and motion is provided for by the ganglia or knots in the cord at each segment of the body.

Fig. 2 shows the sensorium of a perch, all are ganglia of sensation except the two marked *d*, these are analogous to the human brain, the small amount of intelligence in the fish requiring only a very small organ.

It is thus obvious, that all the purposes of common sensation, muscular motion, and special sensation, are provided for by nervous centres before we come to the true brain or the cerebral hemispheres, which can only be the instruments of affection, emotion, understanding, and reason.

Now, what are the inferences we may draw from these facts of the distinct and separate connections of the nerves of special sense with particular portions of brain. Among them must be the conclusion that at this point the special sensation is received by the gray matter, and is transmitted onwards to the true brain, there to become a cognition, there to be supplied with a signification, to be clothed by the faculty of language with a name or sign, for the purpose of being stored in the memory, for the future use of intellect and reason. The optic nerve cannot carry sound, nor the auditory nerve light, each can alone do its own special work, and that special work supplied by a complicated organ only adapted for its own marked specialty. What mind can refuse or doubt this evidence of intelligence? the ear and the eye are made in strict accordance with the laws of light and sound, and these laws must have been in operation before the organs were made and adapted to them. The science of optics as surely existed before the eye was made, as before the microscope was made. The inventors of the telescope and of the microscope could never have made these instruments without the intelligence necessary to understand the science of optics. To compare the poor working of man's slow intelligence with that of his Creator, carries with it a feeling of presumption; but the lesson is so clear and so important, that we may be forgiven in using it for the sake of illustration. Man's intelligence compared with that of his Maker, is indeed limited, but it is of the same nature; we are justified in the faith that it is in this part of his nature that he was made like unto God, and that faith in Divine power equally *beneficent* as it is *intelligent*, which can alone console us for the conflicts, the infirmities, and the difficulties of this life, appears to me to be corroborated and unanswerably established by the certain conclusion derived from our knowledge that the laws of light must have been in existence before the eye was made and adapted in special accordance and contemplation of such laws; proving

at once the ever existing operation of intelligence, and the absurdity of all views of creation from any system of progressive development. I have on other occasions advocated the necessity of some knowledge of physiology for our bodily health; and as no mental health or happiness can exist without religion, I could further advocate the common teaching of physiology in our schools, because at every progressive stage of such knowledge we see more and more evidence of design and adaptation, and become more and more influenced by faith in an all-pervading intelligence in every department of nature. This same view was thus advocated by Sir Benjamin Brodie, in his late address to the Royal Society. " Is there any one in any situation in life to whom it would not be a benefit to know something of animal physiology, of the functions of his own body, and of the influence which his bodily condition exercises over those moral and intellectual faculties, by which he is distinguished from the rest of the animal creation? If it did not teach him how to cure disease, it might be useful for him to know how far disease may cure itself, and what are the limits of nature in this respect. To man, looking at him as an individual, there is no art so important as understanding and managing himself—an art so simply and well-expressed by the two significant words which were inscribed over the heathen oracle of Delphi. To correct bad habits when once acquired, is no easy task. A strong sense and a strong will, such as only a limited number of persons possess, are necessary for the purpose. But it would go far towards preventing the acquirements of such habits, if young persons during the acquirement of their education were made to understand the ill consequences to which they must inevitably lead, and how eventually the body must suffer, and the mind be stupified and degraded, not by the reasonable indulgence, but by the abuse of the animal instincts."

The development and progress of our inner self, our soul, is obviously the real business of life; it proceeds more or less in all people, the educated and the uneducated, the civilized man and the savage, the king upon his throne and the beggar in his hovel, the thoughtful and the thoughtless, the religious being and the sceptic, all are daily adding to their experience, and on the amount of exercise of those powers of inference and deduction possessed by all, will depend the rate of the progress of each individual mind. There can be no doubt that the educated man ought, and as a general rule does, learn more

of the nature of his own mind than the uneducated. To know ourselves should be our first duty; education ought to facilitate the process, and would do so if education was sufficiently directed to the enlargement of our thinking powers. Experience, however, tells most of us that this is not always the result, whether the fault be in ourselves or the mode of education. We all know uneducated men and women, blessed by nature with what is called common sense, who, by the operation of their daily experience, their contemplation of outward nature, their observation on other men and women, and the state of society in which they live, come by reflection on these every day things to an elevation of mind, a knowledge of themselves, an imagination of the future, and a faith in God's providence and revelations, which gives them greater advantages in the blessings of a good conscience and a rational judgment, than can be bestowed by the most elaborate education. So of the civilized man and the savage. Some would think that the negro in the scorching plains of Africa, or the native Australian in his barren unproductive wastes, would be cut off from all knowledge both of the present and of the future; but it is not so. Our Almighty Creator, in the diffusion of his infinite intelligence, has given to all races of men internal powers of mind that cannot fail to develop themselves to some extent by the experience of life. All men, even the most ignorant, do use the internal powers or intuitions with which they are gifted. We know that the most benighted of people have some glimmerings, however faint and imperfect, of a hidden power in nature, which in the earthquake, the thunderstorm, and other of the majestic workings of the wild universe around them, create or develop feelings and thoughts leading them out of the present into the future.

If we only reflect on this one power of mind common to all men, that of contemplating the future, we shall see that God's infinite love for all his children has provided in all minds a never-failing source of consoling reflection. No experience could give us an idea of the future unless there had been in the human mind an intuitive power or faculty by which we are able to appreciate the future as we do the past and the present.

All our notions about time come from an innate faculty of mind, an internal sense, by which we learn the nature of time, just as we learn the nature of light from our external sense of vision. We can only know those things which our

external and internal senses have been fashioned and adapted to bring before our understanding.

Therefore, if in all men and all the races and families of men, there is born within them an aspiration after the future, if it be a fact of the mind, a primitive truth, that influences more or less every human being, and prepares him more or less for a future state of existence, how can we account for the possession of this intuitive sensibility, otherwise than as an intellectual gift imparted to all mankind by the inspiration of an All-seeing intelligence. That this aspiration after the future does exist in all human minds, is proved by the existence in all languages of the future tense of the verb. Universal grammar, that is the science which gives us the knowledge, that one general structure characterizes all languages, that all obey certain laws of the mind, is corroborative of what I have said, and may be advanced as a criterion of truth. In every language among the 3000 and upwards spoken on the earth, there is to be found nouns, verbs, and future tenses of verbs. Nouns are names of objects, and come to our minds through our senses. Verbs are assertions of our minds on the qualities and relations of external objects. Now, verbs can only come to us by an internal process of the mind itself. The eye sees a tree or a multitude of trees, or other objects, and conveys such knowledge to the mind, which, feeling conscious that all such external objects possess certain qualities, asserts its thoughts or opinions by means of its handmaid language: this is the office of the verb, which you must readily see can only come from mind itself. The intellectual powers of all mankind are fashioned after the same Divine model, and therefore the verb is a constituent part of every language, how different soever may be the signs or the sounds of those innumerable tongues by which mankind express their sensations, their emotions, and their ideas. Language is consequently a reflection of the mental powers with which we have been endowed, and universal grammar leads to the knowledge of truths which could only come from God himself. The existence of a future is one of these grand and ennobling truths. The argument stands thus, God is the author of the human mind, and of its power to express itself in language; the idea of the future is inherent in the mind, as is proved by the structure of every language, therefore must our aspirations of the future be true.

There are many other grand truths that may be traced to the universal sensibilities of all mankind did the compass of

a lecture permit so wide an excursion; but I think I have said enough to prove the assertion that some views, some glimmering of a future condition of the human soul is common to all mankind.

May not this be used as a culminating argument against the doctrines now being advanced in America, and taken up by some in England and Europe, that the black races have been intended for subordination to the white races. If this point was fully investigated, I think we must arrive at the conclusion that all men and all races of men have been equally endowed by their common Parent, that he has given all the same structure of brain, similar perceptive organs, similar sensibilities of affection, love and veneration; and that all are equally destined to the same perfectibility and immortality. Therefore is slavery contrary to God's laws, and an equal curse, as daily evidence is accumulating, both to the degraded slave and his degraded master.

We cannot but lament, that in America the doctrine is becoming more and more popular, that the negro is in original formation inferior to the white man, and that he is a link between the higher races of men and the ourang. The question whether there are different races of men is too complicated for present consideration; but I may mention, that the American theory involves the idea that God in the creation of man formed varieties having different degrees of mental and corporeal power. The conclusion of all our best ethnologists is, that all the variations we see in mankind are to be traced to the influence of different climates, and the necessary differences that result in food, clothing, commerce, government; that essentially all mankind are gifted with similar capacity in mental and moral faculties. When we compare a Shakspear, a Milton, or a Newton with the little civilized denizen of a remote country district, or with the hardened criminal of our great cities, we see what enormous differences may be engendered by different habits and pursuits in the same country. Now we know instances where the negro, by cultivation, has exhibited mental and moral powers equal to the ordinary capacities of Europeans. There have been several negro medical students at King's College, who have gone through their examinations as well as other students;—one of them afterwards obtained great distinction at Edinburgh.

During the massacres at St. Domingo, there were negroes who, to save their masters and families, exposed themselves

to the greatest dangers, and exhibited moral feelings, a sense of duty, with an unflinching performance of it, equal to any personal incidents of human affection and attachment in ancient or modern history.

The structure and formation of language may also be used as an argument for the immateriality of the soul. That the brain is essential to the development of the mind is unquestionable; without external senses their nerves and their connection with the brain we could have no sensation or knowledge of the external world and the innumerable objects around us. Without a brain we should have neither feeling, sensibility, nor affection, nor desire; but when desires, affections, sensibilities, feelings, and sensations have been clothed in words and names, when language has been formed beaming with the reflections of all their primitive powers—when language is the true representative of the ideas generated by those united powers, both mind and its expression in the form of words become independent of those powers which connect us with the outward world. When memory has been stored with ideas, when imagination and judgment, and reason, have abundant food within, which language can at any time call forth, we may exist mentally without any further intercourse with the world of objects. The representatives of all objects and all feelings lie deep within us as ideas, all these ideas can be represented in language. Language is immaterial, ideas and reason equally so, and thus is foreshadowed a contemplation of that future of the soul, when the things of this world shall have passed away, and the spirit of man shall be clothed in immortality. In the words of Young—

“ How poor, how rich, how abject, how august,  
How complicate, how wonderful is man !  
How passing wonder He who made him such !  
Who centred in our make such strange extremes,  
From different natures marvellously mixed,  
Connection exquisite of distant worlds !  
Distinguish'd link in being's endless chain !  
Midway from nothing to the Deity !  
A beam ethereal, sullied and absorpt !  
Tho' sullied and dishonoured, still Divine ! ”

I hope to have been able to impress on your minds the following propositions:—1. That there are in every mind primitive facts, instinctive truths or intuitions, which after a certain period of growth and development, show themselves in such assertions as I hope,—I believe,—I exist in time,—I shall exist in futurity.

2. That such facts of the mind can only exist and be derived from the laws of that creative intelligence by which the human mind was formed, and coming as they do from God himself, their teachings must be true.

3. That such facts of the mind are corroborative of all moral and religious truths, and most especially of such as form the basis of Christianity.

4. That if such Divine truths lie embedded in every human mind, and only require cultivation for their growth and manifestation, it follows that all education should be based on these primitive and inherent facts of the mind.

What I have said about the internal sense of time, is applicable to other internal senses, did *present time* permit me to go into them. What is called common sense, that is the general conceptions of the universal family of man, such as an impulse for self-protection, the love of offspring, self-esteem, the sensibilities of conscientiousness, of duty, of love, of veneration, of the sublime and beautiful, &c., &c., are among those intuitive internal senses. You all have seen or heard something of phrenology ; on this bust are enumerated many of our internal senses ; and an enthusiastic phrenologist will tell you they are established truths, viz., not only have we internal senses of affection for others, of esteem for ourselves, and of veneration for God ; but that those parts of the brain which are seated immediately under the portions of the skull so marked, are the respective organs of attachment to others, self-esteem, and religion. Of late years, in consequence of the presumptuous dogmatisms, and quackeries of many phrenologists, the subject has been, I think, unjustly condemned or ignored by our scientific men, who nevertheless are willing to concede that there is some truth in it. The general facts are admitted, that the anterior part of the brain is the locality of intellect ; the upper or top of the head of religion, morals, and a love of truth ; and the lower part behind the neck and base of the brain the seat of those desires and propensities we have in common with the animal creation. But between these parts, and corresponding with the posterior lobe of the brain, the phrenologists locate some of the superior sensibilities possessed by man alone, or very partially by some of the most intelligent of the mammalia ; the social instincts : the ties of family, of friendship, of country, and of race. One of the arguments used against phrenology has been, that the posterior lobe of the brain is larger in man than in any other animal. Now, if it be true that the convolutions of this part

of the brain are the seat of the internal senses of affection, love of offspring, and attachment to home, to country, and to society, there will be nothing inconsistent in man possessing the largest posterior as he does the largest anterior lobe of the brain. That there is some truth in phrenology, all observers of mankind must admit. No one ever saw a large and well-formed forehead in an educated man, without the accompaniment of great power in dealing with all questions of comparison, of the causes and relations of objects and their phenomena, and of the logical treatment of any opinion which his intelligence had grasped. The heads of Shakspear, Lord Bacon, and most distinguished men, in addition to being large, exhibit great symmetry and regularity of both sides of the brain. Such heads are almost globular. So far as my observation goes, symmetry of both sides of the brain is a material point, as exhibiting intellectual and moral power; and this we should also infer from our knowledge of the fact that all our senses, external and internal, are double; the brain has two halves, as distinct as the two eyes, and as he sees best whose organs of sight on both sides are in perfect harmony and of equal power, so we should expect that he would know most and best who had both sides of his brain in perfect harmony as regards form and structure. It must not be supposed that phrenologists consider the outer surface of the brain as the organ of thought, or the structure by which we think; this is not so. A phrenologist may believe in the immateriality of the mind itself, as fully as the most determined spiritualist: the organs he conceives, as placed on the surface of the brain, are those by which knowledge of every kind is acquired, such cognitions being thence carried inwards by the white centre of the brain, to undergo some change by which they are clothed in language, and converted into ideas. That we have internal senses which act intuitively in enabling us to form conceptions on many subjects which are not brought before the mind by the experience of our external senses, is unquestionable;—our ideas of time, space, infinity, eternity, of our own existence, and the power of contemplating the Great Being who gave us those transcendent sensibilities from which emanate our pleasure in the admiration of the beautiful, the sublime, the true, the good.

The surface of the brain, therefore, is not considered by all phrenologists as the seat of the mind, but as that of those internal senses by which we learn facts relating to form, proportion, order, time, number, colour, harmony, &c.

There is nothing inconsistent with what we know of the operations of the mind, to suppose that the surface of the convolutions of the brain, which consists entirely of that gray matter, essential both to sensation and motion, gives us cognisance of those facts of mind which we certainly obtain from some internal principle. Why may not one convolution be an internal special sense for colour, another for time, another for number, and so on, being of the nature of ganglia, having power over such special facts, just as the gray nervous matter at the bottom of the eyeball, and the gray nervous matter of the ear, take cognisance of the facts relating to light and sound. Nobody considers the nervous structure of the eye or the ear as the seats of the ideas we form of light, colour, or sound, but only as the instruments by which a knowledge of these facts is carried inwards to the mind itself, there to be appreciated and understood. So may the external crust of the brain be the seat of those numerous internal senses which take cognisance of, which perceive the facts of form, time, order, &c., and transmit them to the mind. We have internal senses of another kind which phrenologists also contend are located on the vertex, the top of the brain, the moral sentiments, conscientiousness, veneration, benevolence, &c., and it is a remarkable fact that the great Italian painters who could know nothing of phrenology have painted Christ and his disciples with very lofty crania, very prominent in those parts where on the phrenological bust is placed the organs of benevolence, admiration, veneration, &c. In the "Last Supper" of Leonardo, you will see the head of Judas flat, instead of prominent on the top. The head of Sir Walter Scott is very remarkable for the great elevation of this region, and in examining the authentic busts of all distinguished people we cannot fail to observe facts corroborative of the general truth of phrenology. That there must be many errors, not only in the location of faculties on the head, but in their number and classification is most certain, but I must bear testimony to the fact that, if I know anything worth knowing of mind and its phenomena, I owe much of that knowledge to Gall, to Spurzheim, and to Combe.

Many who deny phrenology as a whole, are not unwilling to admit that there is evidence for the location of groups of faculties: for example, that in the front of the brain are situated those internal senses which generate the intellectual powers of comparison, causality, &c.; on the top of the head, the internal sensibilities which generate the religious and

moral powers; that in another part of the brain are the internal senses which generate the social affections; while the animal propensities are connected with the base of the brain. Surely it is no improbable hypothesis to suppose, that the whole surface of the brain is a congeries of internal senses having powers similar to those of the external senses, to generate sensations, perceptions, and cognitions, which being received by the understanding and clothed with language, become ideas of the mind. Ideas being fixed in the memory by appropriate signs, can at any time be recalled either by spoken or written language, producing associations which rouse the sensibilities, emotions, perceptions, or cognitions, these being the functions of that large amount of gray matter spread over the surface of the brain. At the same time it is clear, that when once the mind has gathered to itself knowledge under the form of ideas, it becomes thereafter independent of the aid of its material helpmates, the external and internal senses. We know that we can recall a well-remembered landscape without the aid of the eyes, or a tune without the aid of the ears. Those who become blind or deaf can recall what they have formerly seen and heard, although incapable of adding more to their stock of knowledge by means of the lost senses. The former teachings of the senses remain although the senses themselves are gone; the mind which had been originally developed through the medium of the senses, no longer requires their aid; its immaterial principle is now all-sufficient, and it remains imperishable amidst the decay of its former associates—the senses, the nerves, and the brain.

“ The Soul, secur’d in her existence, smiles  
At the drawn dagger and defies its point,  
The stars shall fade away, the sun himself  
Grow dim with age, and nature sink in years,  
But thou shalt flourish in immortal youth,  
Unhurt amidst the war of elements,  
The wreck of matter and the crush of worlds.”

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